Altitude 4511 Access Point Evaluation Guide

This document will describe the industrial design and modularity, and provide step-by-step configurations for typical use cases in multi-tenant markets such as hotels. The glossary of features lists the webUI screens, along with a short description of the functionality. The high-powered radio will need to be tested by comparing the Altitude™ 4511 with other, “known” access points. When the comparison is made, the value of the Altitude 4511 will become more apparent.

Make Your Network Mobile

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The Extreme Networks Altitude 4511 Access Point can change the way wireless networks are installed, while lowering the deployment and operations expense associated with a wireless network.

When evaluating the Altitude 4511, take note of these three key features and their cost saving advantages:

Advanced Industrial Design – "Hide-in-Plain-Sight"

The Altitude 4511 access point installs in minutes anywhere a CAT 5/6 cable is located. Due to its tiny size, the Altitude 4511 will hide in plain sight; ceiling mount, tabletop, or wall surface. A patent-pending mechanical design is optimized for installation over any structured wiring CAT 5/6 wall jack. The wallplate form factor is 25mm (1 inch) thick, and flush mounted to the wall surface. The AP does not protrude into the wall cavity. This design allows for efficient heat transfer and a universal installation over any structured wiring plate. The modular design allows the end-user to add switched Ethernet ports as needed, and snap in any keystone or Leviton QuickPort® style connector to the wallplate.

High-Powered 802.11a/b/g/n Radio

Under the sleek exterior, the Altitude 4511 packs a 26dBm transmitter along with dual omni-directional 3dBi peak gain antennas. The AP supports either 2.4Ghz or 5.2Ghz operating bands. 2x2 multiple-input and multiple-output (MIMO) technology and support for legacy 802.11a/b/g is ideal for supporting a wide range of laptops, portable media players, tablets, mobile computers, Wi-Fi phones and wireless enabled smartphones.

Controller AP

The Altitude 4511 can be managed via CLI or webUI as a standalone access point. When more than one AP is installed, any single Altitude 4511 can operate as a Controller AP for a network of up to 25 Altitude 4511s. By using the hardware of an access point to run controller features, the Altitude 4511 dramatically lowers the cost of a managed, RF controller-based network for small hotels. All the features you want from an RF controller are here; firmware management, central configuration, status and statistics. Also advanced features such as fast roaming, Smart RF, and Rogue AP detection are all included in the Controller AP function.

Scope of this Document

This document will describe the industrial design and modularity, and provide step by step configurations for typical use cases in multi-tenant markets such as hotels. The glossary of features lists the webUI screens, along with a short description of the functionality. The high powered radio will need to be tested by comparing the Altitude 4511 with other, "known" access points. When the comparison is made, the value of the Altitude 4511 will become more apparent.

Use Case 1: Configure a single AP as a standalone AP using the configuration overrides.

Use Case 2: Use the Initial Setup Wizard to configure a Controller AP and dependent APs with one WLAN.

Use Case 3: Use the configuration screens to configure a Controller AP with two WLANs; one open and one secure. VLANs will be added to WLANs and switched Ethernet ports.

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Advanced Industrial Design

Key Features

- Keystone or Leviton QuickPort® connector
- One port RJ-45 Ethernet Module, Three port RJ-45 Ethernet Module
- Snap-on installation in any location where an Ethernet cable is located

Keystone Connector

The snap-in port is designed to accept any keystone-style or Leviton QuickPort® connector. These connectors are a popular mechanical form factor for RJ-11, RJ-45, F-connector and many more network and communications connectors.

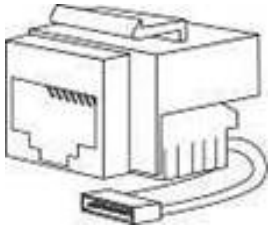
Snap out the blanking plug on the wallplate and snap in the connector of your choice. The latch on the keystone connector should always face toward the top of the AP.

RJ-45 Connector for Ethernet or Digital Phone

RJ-11 Analog POTs Connector

One-Port RJ-45 Ethernet Module

The keystone port also accepts a one-port RJ-45 Ethernet Module. This module is supplied in the shipping box with a pigtail connector terminating in a 9-pin header. Snap in the RJ-45 connector and connect the header pin to the matching header on the back of the unit, labeled “FE1”



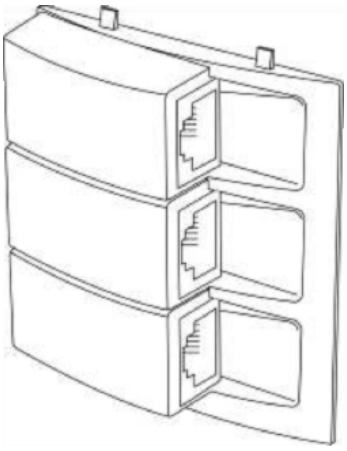
RJ-45 Ethernet Module – Supplied

Three-Port RJ-45 Ethernet Module

The front of the Altitude 4511 has an access cover that can be removed to expose a hidden connector. A three-port RJ-45 Ethernet Module connects to the hidden header and snaps onto the Altitude 4511 in place of the access cover.

Remove the access cover by using a sharp tool to depress the latch on the bottom of the Altitude 4511. Pull the access cover up and away from the Altitude 4511. Reverse the procedure to install the three-port Ethernet Module.

The Ethernet Module has three ports labeled “FE2”, “FE3”, and “FE4”.



Three Port RJ-45 Ethernet Module – Optional

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Vital Information Before We Begin

Power

The Altitude 4511 requires Power over Ethernet. Connect an 802.3af PoE switch or PoE midspan injector to the port labeled UP1/PoE on the back of the unit. The AP will draw between 6.5W and 9W of power depending on the number of Ethernet ports connected and the transmission speed.

The AP takes three minutes to completely boot up. At two minutes, the Web server is active and will respond to a Web browser. However, the backend database will not authenticate user login for another minute.

Login

The Altitude 4511 can be accessed from a webUI or CLI. This guide will use the webUI login.

The webUI requires the Adobe Systems flash plugin. If it is not installed, the webUI will prompt the administrator to install flash.

For instructions on upgrading the system firmware, see the Appendix.

Default user name: admin

Default password: admin123

Default IP address: IP address assigned by DHCP client, or zero-config IP address where the last two octets in the IP address are the decimal equivalent of the last two bytes in the MAC address.

Example: MAC address 00:C0:23:00:F0:0A

Zero-config IP address: 169.254.240.10

To use the zero-config IP address, manually set your PC to same IP subnet. See the Appendix for further assistance converting the MAC bytes in hex to its decimal equivalent.

After the first login following a factory default configuration, the administrator will be prompted to change the password.

Please change the default password
Your system is currently using the factory default login credentials. It is recommended that you change the default password to protect from unauthorized network access.
New Password
Retype to Confirm
Apply
Logout

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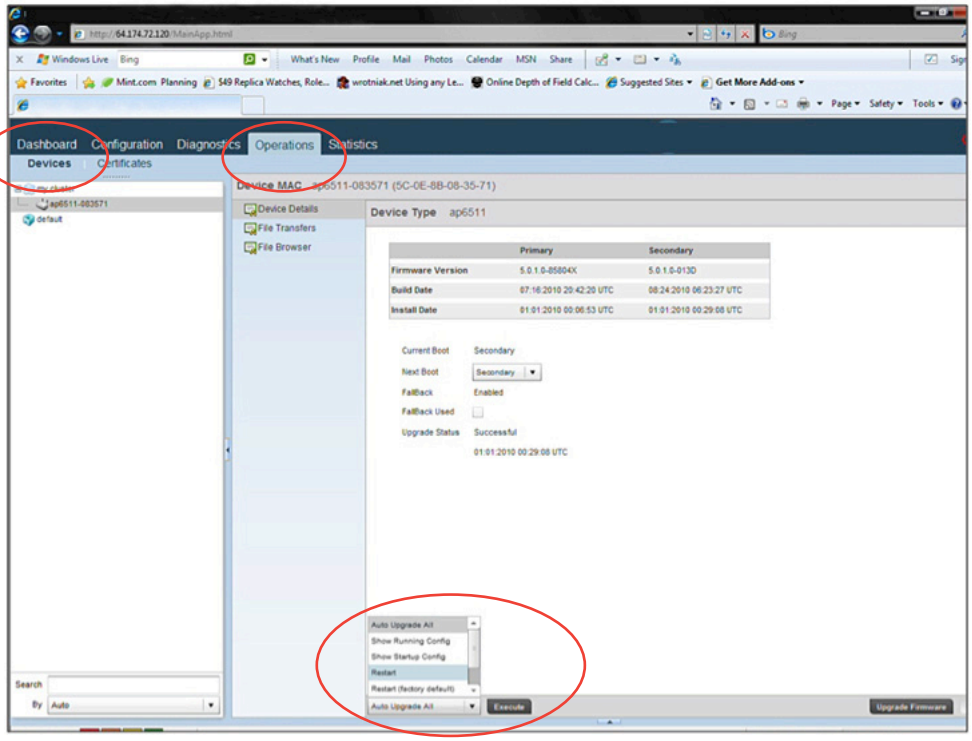
Reset Default Configuration, View Running Config

Use the Operations menu to reload firmware, restart, or view the running configuration. Navigate to Operations -> Devices. Select the action from the list at the bottom of the page.



Controller AP

A Controller AP is any single Altitude 4511 that is configured to operate as an RF controller. The Controller AP provides a necessary set of management features required for a small facility. Key features of the Controller AP include:

- Automatic adoption of dependent APs
- Central configuration for all APs
- Firmware upgrade on all APs
- One IP address for the network management. The dependent APs are managed via a secure Layer 2 protocol. IP addresses can be assigned to dependent APs if desired
- Central status and statistics for APs and connected wireless clients
- IPS/IDS for rogue AP detection
- SmartRF for efficient spectrum management and redundancy
  - Automatic channel selection
  - Automatic transmit power adjustment
  - Neighbor AP recovery
- Fast roaming for mobile devices
- Role-based client access
- Layer 2 and Layer 3 access control

By default, an AP will be dependent if a Controller exists in the network. Adoption is automatic.

A dependent AP obtains its configuration from a profile stored on the Controller AP. Any manual configuration changes on a dependent AP will be overwritten by the Controller upon reboot. Up to 24 dependent APs can be connected to a Controller AP.

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Initial Setup Wizard

The Wizard will run automatically after a factory reset. It will walk the administrator through a set of minimum required configurations. Once complete, profiles will be created and assigned to the device. To restart the Wizard, you must reset the unit to factory defaults. See the Appendix for instructions on resetting the factory default configuration.

The configuration screens in the Setup Wizard include:

Operating Mode: Standalone AP; Controller AP; Dependent AP

Basic System Info: Password, Timezone, Country, Network Access

VLAN and IP Address: Set the native VLAN and member VLANs for all interfaces. Set whether the interface is an access or trunk port. Assign the IP address to the uplink LAN port.

WLAN Configuration: Set up multiple WLANs and set the minimum required information such as SSID, Authentication, and VLAN. If needed, set up a RADIUS server to authenticate a WLAN.

Initial Setup Wizard
An initial setup wizard is available to aid in configuring a simple WLAN deployment. The wizard will guide configuration of the following features:
1. Location, country, and time zone
2. Bridge or Router operation
3. WLAN configuration
4. AP discovery
Would you like to use the wizard?
Start Wizard
Not Now

Policies, Profiles and Adoptions

Policies

Most (but not all) configuration elements such as Firewall and WLAN are configured as a policy. Multiple policies can be created and edited. Once a policy is created, it must be mapped onto a device profile. If a policy is edited, those edited changes are automatically applied to any device mapped to that policy.

Note that there are policies inside of policies. For example, Wireless Clients can be allowed or denied access to the network based on an IP or MAC firewall policy. Thus, the Wireless Client Roles policy requires a Firewall policy.

Policies can be created at any time. When the administrator is presented with a drop down box to select a policy, there will always be a “create” and “edit” button to allow the additional policy to be created at that time.

To keep the configuration steps clear, we recommend creating a core set of policies at the beginning. Thus, these policies will be ready for selection when the device profiles are created.

Device Profiles

Device Profiles are a container for policies and other configurations, and are assigned to devices either manually or by an adoption policy. Device profiles should be created for major groups of devices. For example, a typical network would have at least two profiles; one profile for the Controller AP, and one profile for all dependent APs. If APs will service distinct areas of a hotel; such as guest rooms and meeting rooms, then a unique dependent AP profile may be created for each of these unique applications.

Device Overrides

Note that any profile configuration can be overridden by specifically configuring the device. It is recommended that device overrides be used at a minimum. Commonly, a device override is used to assign the management IP address and default gateway to a Controller AP. Another use for device overrides is to quickly configure a standalone AP. If a device configuration is overridden, be certain to document the configuration to prevent confusion later.

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Adoption

Dependent APs are adopted by a Controller AP. By default, each AP is standalone or dependent. When a new AP is installed in the network, it will begin the network discovery process to find a Controller AP. On the Controller AP, an adoption policy can be created to control which APs are adopted. The policy rules can include MAC address, serial number, DHCP option, and other parameters.

TIP
Configure Policies first then map policies to Device Profiles. In a simple network, edit the "default" policy to match your requirements rather than create new policies.

Policies Available for Configuration

Refer to the Appendix for a description of each of these policies. The core policies that will always be configured are shown in green. Note that there are policies inside of policies. Also, some policies, notably firewall policies, can be selected in multiple screens.

Policies	WebUI Navigation
Devices Menu	
Adoption Policy	Profile -> <profile name>
RF Domain Menu	
RF Domain	RF Domain
Wireless Menu	
WLANs	Profile -> <profile name> -> Radio -> WLAN Mapping
WLAN QoS	<link to other policy> Wireless -> Wireless LAN -> Basic Configuration
Radio QoS	Profile -> <profile name> -> Radio -> Radio Settings
Remote AAA Server	<link to other policy> Wireless -> Wireless LAN -> Security Services -> Captive Portal
MAC Association ACL	Profile -> <profile name> -> Radio -> Radio Settings <link to other policy> wireless -> wireless lan -> firewall
SmartRF	<link to other policy> RF domains -> Basic Configuration
Bridging	Profile -> <profile name> -> General
Security Menu	
Wireless Firewall	Profile -> <profile name> -> Security -> Settings
IP Firewall	Profile -> <profile name> -> Interface -> Ethernet ports Profile -> <profile name> -> Interface -> Virtual Interface <link to other policy> Wireless, Wireless LAN, Firewall
MAC Firewall	Profile -> <profile name> -> Interface -> Ethernet ports Profile -> <profile name> -> Interface -> Virtual Interface <link to other policy> Wireless, Wireless LAN, Firewall
Wireless IPS	<link to other policy> RF Domains -> Basic Configuration
Wireless Client Roles	Profile -> <profile name> -> Security -> Services
Services Menu	
Hotspot	<link to other policy> Wireless -> Wireless LAN -> Security
DNS Whitelist	Services -> Captive Portal
Management Menu	
Management Policy	Profile -> <profile name> -> Management -> Settings

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Use Case One

This case will show the configuration required for a Standalone AP using the device Overrides configuration. This is the most direct method to configure a standalone AP and is ideal for conducting a site survey.

Extreme Networks equipment required:

One (1) Altitude 4511

Third-party equipment required:

Two PCs; one upstream and one downstream. Set the PCs with a static IP address to be on the same subnet.

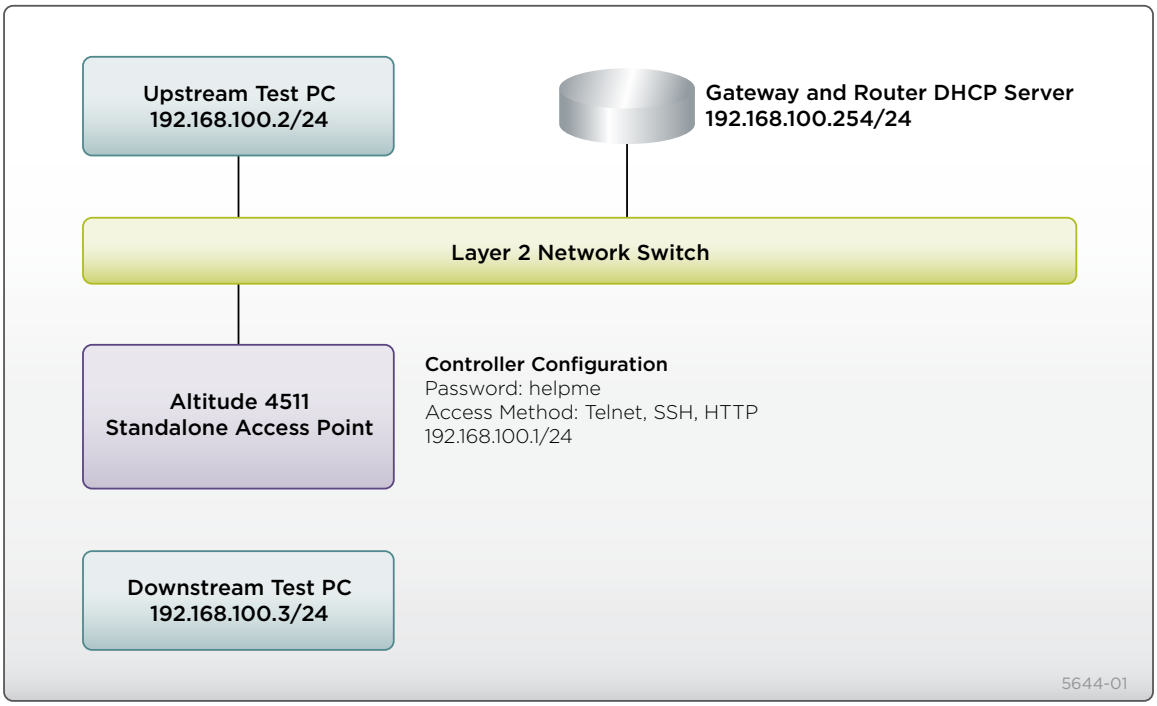
Alternatively, connect the Altitude 4511 to a subscriber gateway and test using an Internet connection.

Test Setup

Configure the network and test PCs as shown in the diagram.

Diagnostics

- Verify the test PCs have the correct IP addresses
- Verify the AP actually has a WLAN associated. Use the information in the Diagnostics section to view the WLANs and wireless clients on each AP



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Configuration

Use the device Overrides configuration to configure a standalone AP. Profiles can be used, but the easier path is to directly configure the device.

RF Domain Overrides

webUI navigation: Configuration -> Devices -> Device Configuration -> RF Domain Overrides

Select Time Zone and Country

Click OK

Profile Overrides

webUI navigation: Configuration -> Devices -> Device Configuration -> Profile Overrides

Virtual Interface with IP

Click Interfaces -> Virtual Interfaces
Click Add, leave the VLAN 1 name
    Uncheck “Use DHCP to Obtain IP”
    Assign an IP address, 192.168.100.1/24
Click OK, then Exit

Radio and WLAN

Click Interfaces -> Radios
    Select Radio1, click Edit
    Under Radio Settings
    Select an operating Channel. Do not select “Smart”
    Enter a Transmit power e.g. “24”. Do not select “Smart”
Click OK
    Select the WLAN Mapping screen
Click Create a New WLAN
    Enter a friendly name in the top box, Enter an SSID
Click create next to the WLANQoS box. Enter a friendly name
Click OK, then Exit
Click OK, then Exit
    Select your WLAN from the right side pane, click the << arrow
Click OK, then Exit

Default Gateway

Click Network -> Static Routes
Click Add Row
    Enter 0.0.0.0/0 as the network address
    Enter 192.168.100.254 as the gateway
Click OK

Commit and Save
Click the Commit button, then Save in the upper right corner

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Use Case Two

One WLAN will be configured with open authentication. The access points will bridge all packets and VLANs will not be used anywhere in the network. This Use Case will use the setup wizard. Reset the unit to the factory default before beginning this use case.

Set static IP addresses on test PCs for this test.

Extreme Networks® equipment required:

Two (2) or Three (3) Altitude 4511s. One will serve as the Controller for the network.

Third-party equipment required:

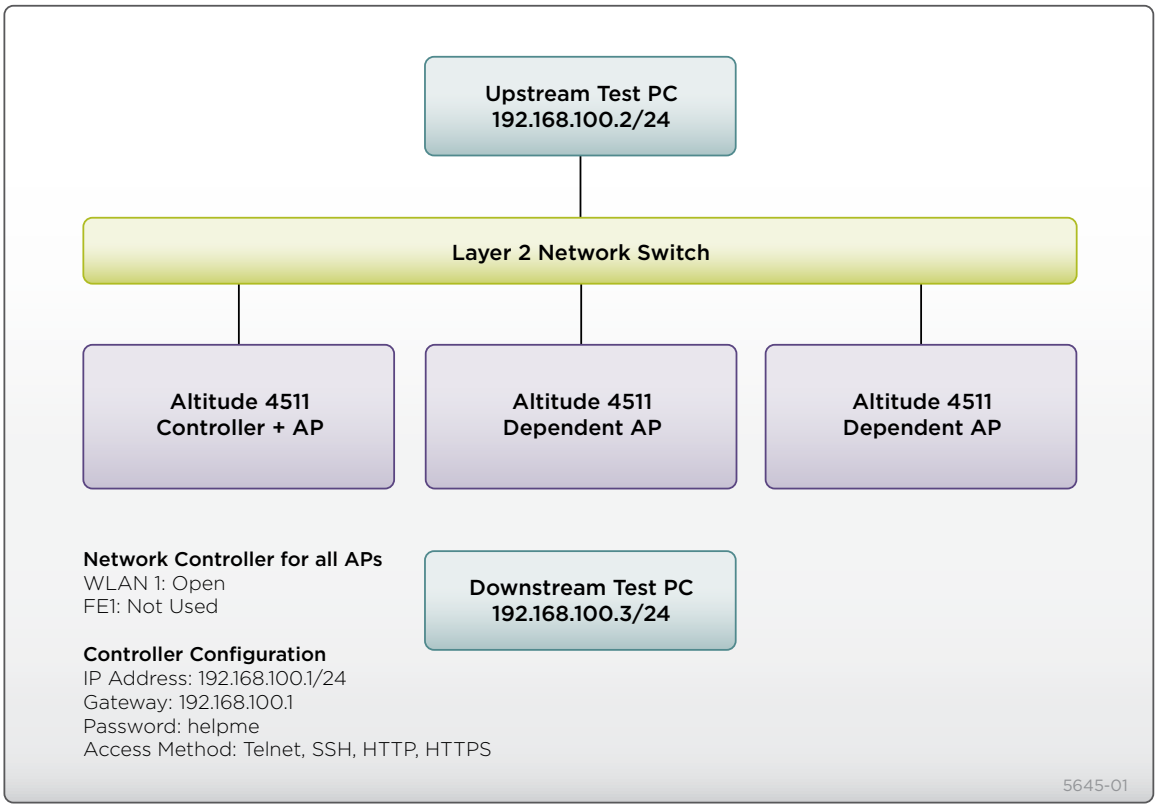
The uplink LAN ports of the access points can be connected to a Layer-2 network switch or to an Internet router. A PC with a wireless network card can be used to test the network.

Test Setup

1. Reset the unit to factory defaults. Consult the Appendix for instructions
2. Connect three APs to a Layer-2 switch
3. Connect a upstream test PC to the upstream Layer-2 switch
4. To connect to the AP you wish to designate as the Controller, use the zero-conf IP address:
   - Set the upstream Test PC to a manual IP address in the 169.254.x.x network
   - Convert the last two bytes of the AP MAC address to decimal (see Appendix)
5. When the configuration is done; set the IP address of the upstream Test PC to 192.168.100.2.

Diagnostics

- Verify the wireless test PC and upstream PC have IP addresses in the same subnet.
- Verify the AP actually has a WLAN associated. Use the information in the Diagnostics section to view the WLANs and wireless clients on each AP



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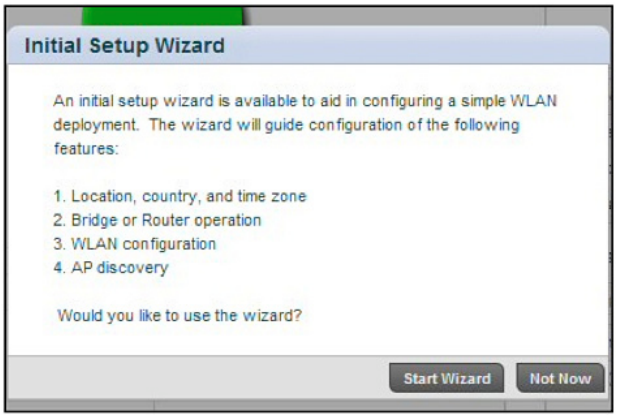
Configuration

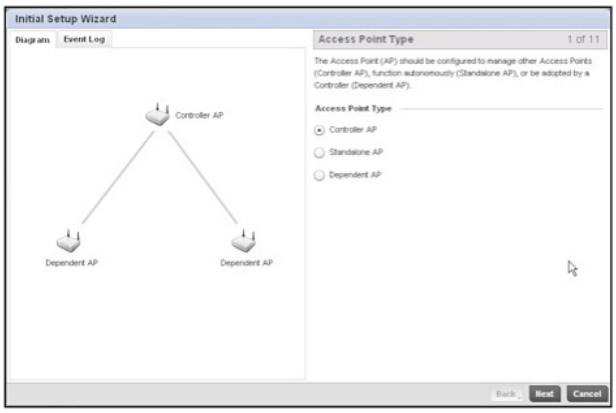
The setup wizard will start on the first boot after a factory reset. To reset the AP to factory defaults, press the reset button on the bottom of the AP.

Click Start Wizard


Initial Setup Wizard
An initial setup wizard is available to aid in configuring a simple WLAN deployment. The wizard will guide configuration of the following features:
1. Location, country, and time zone
2. Bridge or Router operation
3. WLAN configuration
4. AP discovery
Would you like to use the wizard?
Start Wizard
Not Now

Select “Controller AP”

Click Next



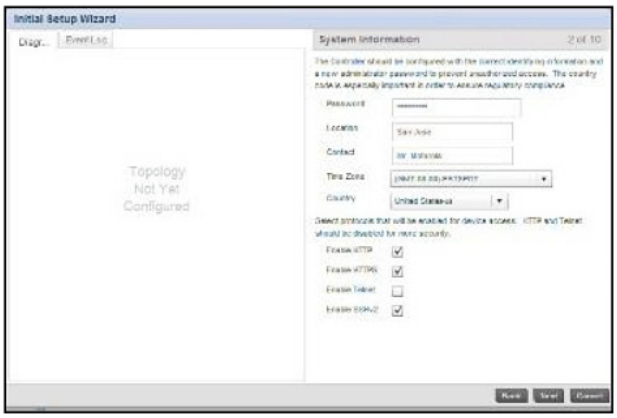
Enter a new system password

Enter a location and contact. This will be used in the SNMP system OID.

Select the Time Zone and Country

Select the type of network access that you will allow

Click Next



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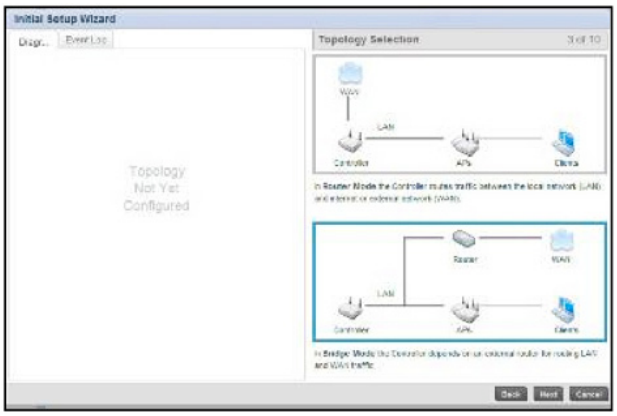
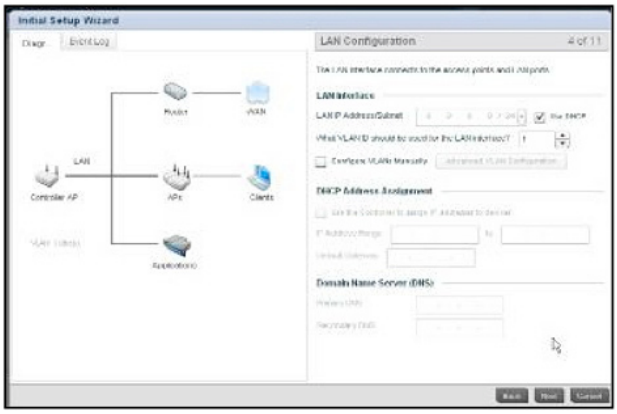
Select Bridge Mode

Click Next



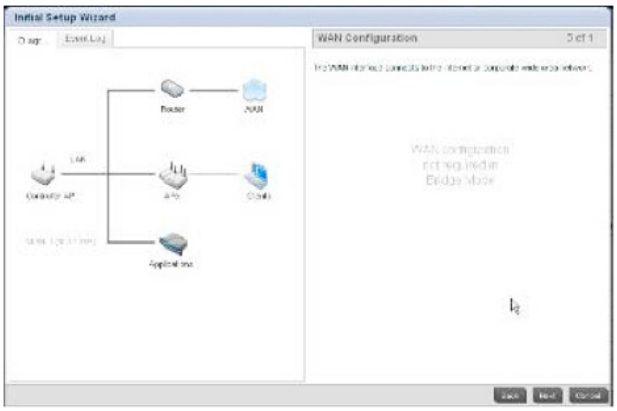
Enter 192.168.100.1/24 as the LAN IP

Click Next



In this example, we will not be using the router mode.

Click Next



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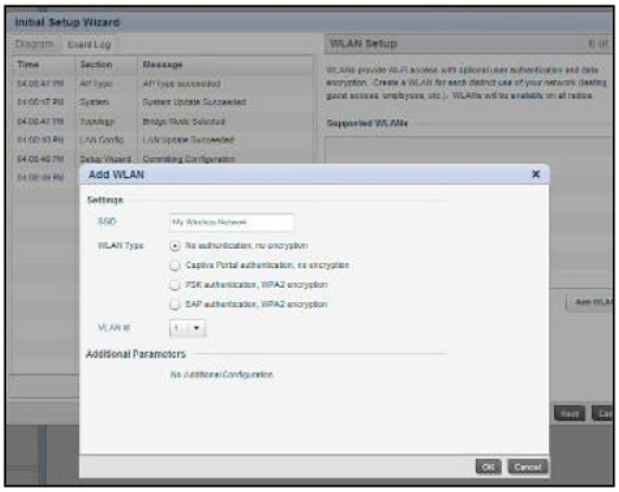
Click the “Add WLAN” button

Enter an SSID, select No authentication

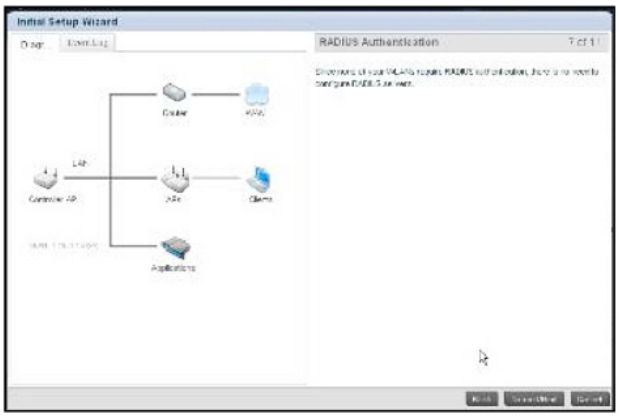
Click OK

Click Next



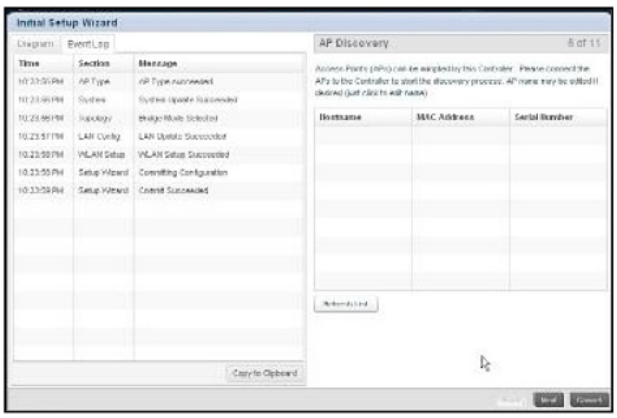
Since we are using Open authentication, RADIUS configuration is not needed.

Click Commit/Next



The dependent APs will be adopted by this Controller AP and will show up in the discovery list.

Click Next



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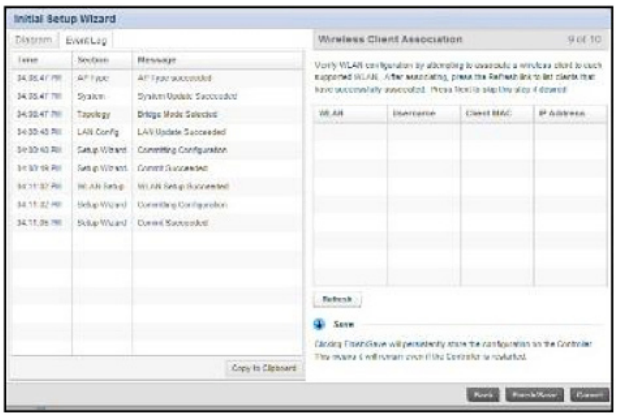
Connect a wireless Test PC to the WLAN

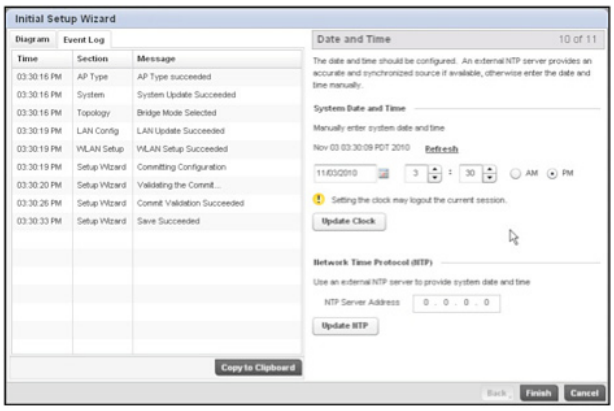
The wireless Test PC will show up in the Wireless Client Association list

Click Finish/Save



Set the time or enter an NTP serve

Click Finish


Initial Setup Wizard
Diagram
Event Log
Time
Section
Message
03:30:16 PM AP Type AP Type succeeded
03:30:16 PM System System Update Succeeded
03:30:16 PM Topology Bridge Mode Selected
03:30:19 PM LAN Config LAN Update Succeeded
03:30:19 PM WLAN Setup WLAN Setup Succeeded
03:30:19 PM Setup Wizard Committing Configuration
03:30:20 PM Setup Wizard Validating the Commit...
03:30:26 PM Setup Wizard Commit Validation Succeeded
03:30:33 PM Setup Wizard Save Succeeded
Copy to Clipboard
Date and Time
10 of 11
The date and time should be configured. An external NTP server provides an accurate and synchronized source if available, otherwise enter the date and time manually.
System Date and Time
Manually enter system date and time
Refresh
Setting the clock may logout the current session.
Update Clock
Network Time Protocol (NTP)
Use an external NTP server to provide system date and time
NTP Server Address
Update NTP
Back
Finish
Cancel

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Use Case Three

Two WLANs will be configured; one with open authentication and the other with a pre-shared key authentication. The access points will bridge all packets and a unique VLAN ID will be assigned to each WLAN and the Fast Ethernet port.

This configuration can be done using the Wizard or the webUI policies and profiles configuration screens.

Static IP addresses will be assigned to the test PCs.

Extreme Networks equipment required:

Two (2) or Three (3) Altitude 4511 APs. One will serve as the RF Controller for the network.

One RJ-45 snap-in Ethernet Module.

Third-party equipment required:

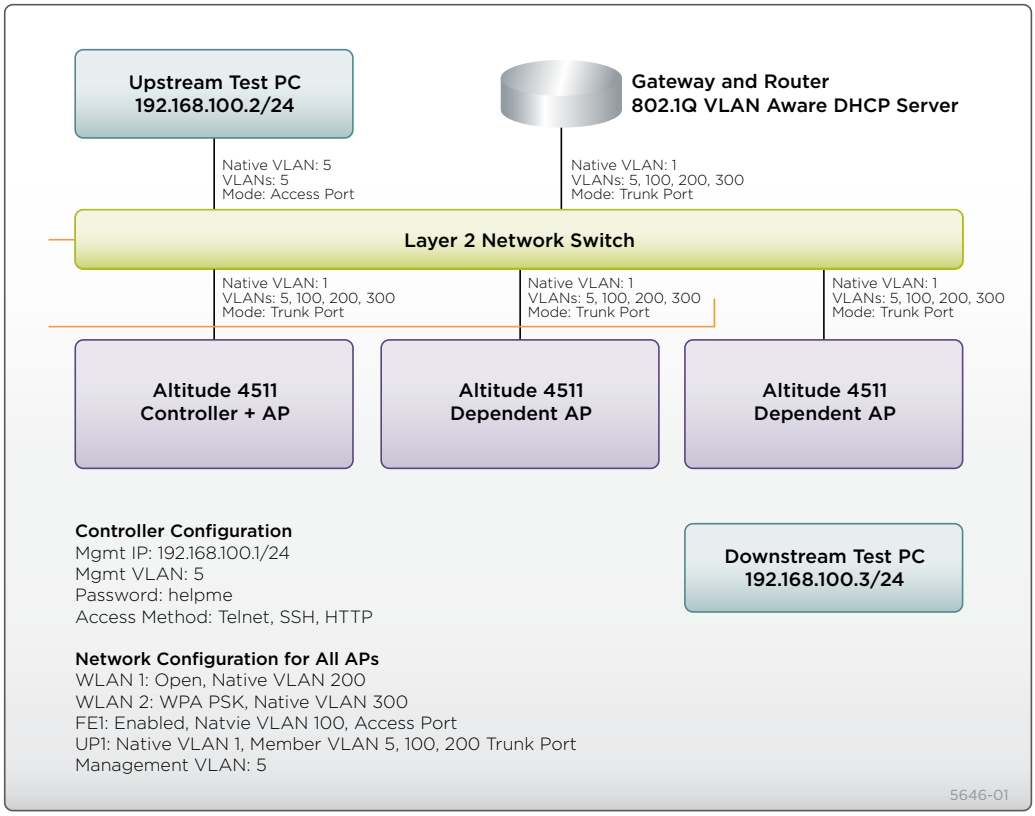
A subscriber gateway that understands 802.1Q VLANs is recommended. Alternatively, a Layer-2 network switch can be configured with VLAN trunk ports and access ports. A PC with a wireless network card can be used to test the network.

Test Setup

1. Snap-in the RJ-45 module to the keystone port. Connect the pigtail on the RJ-45 module to the header on the back of the AP
2. Configure the network and test PCs as shown in the diagram

Diagnostics

- Verify the test PCs have the correct IP addresses
- Verify the AP actually has a WLAN associated. Use the information in the Diagnostics section to view the WLANs and wireless clients on each AP



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Configuration

Create Adoption Policy

webUI navigation: Configuration -> Device -> Adoption Policy

Click add
- Enter a name

Click Continue
Click add
- Select Match Type, any
- Select Profile Name “dependent-AP4511”

Click OK, then Exit

Create an Open WLAN

webUI navigation: Configuration -> Wireless -> Wireless LAN

Click add
- Assign a friendly name for the WLAN
- Enter an SSID e.g. Guest-Open
- Enter 200 in the VLAN pool box

Click OK, then Exit

Create a Secure WLAN

webUI navigation: Configuration -> Wireless -> Wireless LAN

Click add
- Assign a friendly name for the WLAN
- Enter an SSID e.g. Guest-Secure
- Enter 300 in the VLAN pool box

Click OK
Click Security, click WPA2-CCMP in the “Select Encryption” option
- Clear the Pre-Shared Key field, click the show box
- Enter an ASCII string between 8 and 63 characters e.g. extremenetworks

Click OK
Click Client Settings, uncheck Client-to-client Communication
Click OK, then Exit

Create SmartRF Policy

webUI navigation: Configuration -> Wireless -> SmartRF (or edit the default SmartRF policy to match your settings)

Click add
- Assign a name
- Leave sensitivity at Medium
- Check the option to Enable SmartRF policy

Click OK, then Exit

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Create a Primary Controller AP Profile

webUI navigation: Configuration -> Profiles (or edit the default Controller AP Profile to match your settings)

Click add
- Assign a name, select the ALTITUDE 4511 type
- Check the box to Set as Controller AP
- Leave adoption policy at <none>

Click OK
Click Interface -> Ethernet Ports
- Select FE1
- Enter 100 as the Native VLAN

Click OK, then Exit
- Select UP1
- Set the mode to Trunk
- Enter 5, 100, 200, 300 in the Allowed VLANs box

Click OK, then Exit

Click Virtual Interfaces
Click add
- Enter 5 in the VLAN ID box
- Enter management VLAN in the description
- Enter 10.10.10.2/24 in the IP address field

Click OK, then Exit
Click add
- Enter 100 in the VLAN ID box
- Enter Fast Ethernet port 1 in the description

Click OK, then Exit

Click add
- Enter 200 in the VLAN ID box
- Enter Open WLAN in the description

Click OK, then Exit

Click add
- Enter 300 in the VLAN ID box
- Enter Secure WLAN in the description

Click OK, then Exit

Click Radio
- Select radio1, click Edit

Click WLAN Mapping
Select your WLANS from the right side, click the arrow to map it to your radio
Click OK, then Exit

Click Network
- Select Static Routes, click Add Row
- Enter 0.0.0.0/0 in the Network Address field, and your router as the Gateway

Click OK, then Exit

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Click Management
Select Settings, Select the default Management Policy, click the Edit button
Select the access modes you wish to enable; Telnet, SSH, HTTP, HTTPS
Under Access Restrictions, select “source-address” as the Filter Type
In the “Source Subnets” field, enter 10.10.10.0/24
Click OK, then Exit

Edit the Dependent-AP Profile

webUI navigation: Configuration -> Profiles

Select dependent-AP4511, click Edit
Select your adoption policy from the drop down list
Click OK

Click Interface -> Ethernet Ports
Select FE1
Enter 100 as the Native VLAN
Click OK, then Exit

Select UP1
Set the mode to Trunk
Enter 100, 200, 300 in the Allowed VLANs box
Click OK, then Exit

Click add
Enter 100 in the VLAN ID box
Enter “Fast Ethernet port 1” in the description
Click OK, then Exit

Click add
Enter 200 in the VLAN ID box
Enter “Open WLAN” in the description
Click OK, then Exit

Click add
Enter 300 in the VLAN ID box
Enter “Secure WLAN” in the description
Click OK, then Exit

Click Radio
Select radio1, click Edit
Click WLAN Mapping
Select both of your WLANS from the right side, click the arrow to map it to your radio
Click OK, then Exit

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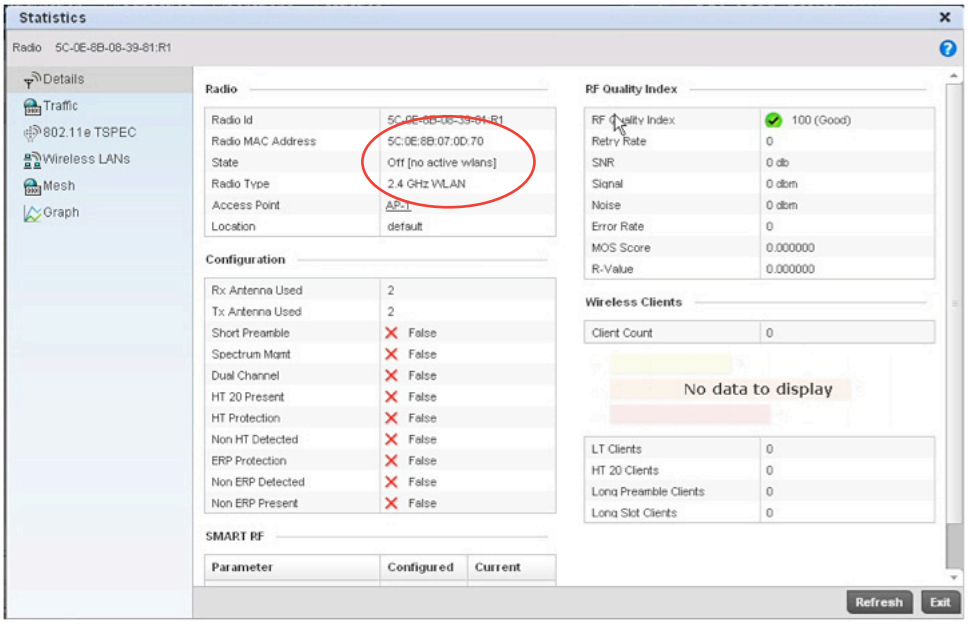
Diagnostics

Network and Access Point Statistics

The Controller AP and its network of connected access points can be examined using the Statistics menu. From here, note how the list of displayed statistics will change depending if you select the RF Domain, the Controller AP, or one of the Dependent APs.

To determine if a WLAN is operational, click Statistics, then select the Controller AP. Click on the “Radios” option. Note the State of the radio.

In the example shown below, the radio is OFF because a WLAN has not been mapped to the radio.



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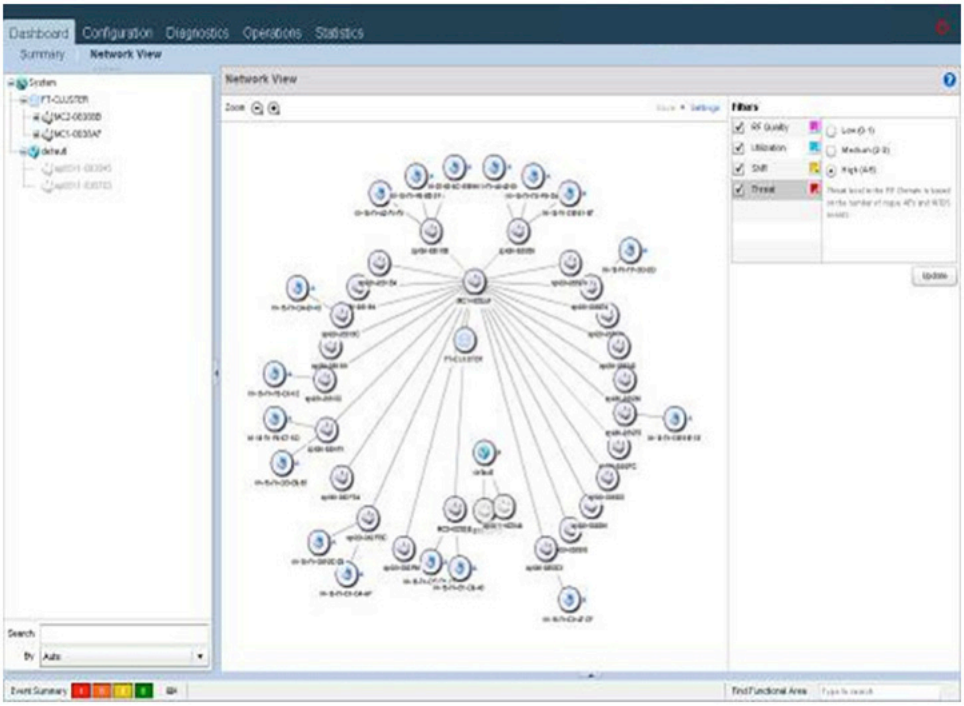
Network View

The Dashboard view provides quick status of the network and clients. One key feature of the Dashboard is the Network View where the administrator can color code the wireless clients using quality indicators.

The indicators are RF Quality, Utilization, SNR, and Threat. For each indicator, a filter can be applied with Low, Medium, and High thresholds.

Use the Dashboard Network View to quickly gauge the status of the wireless clients and identify if corrective action is needed.

Double click on a client to see detailed statistics about the connection.



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Common Configuration Mistakes

This section will be updated during the course of the evaluation period. It will contain common configuration mistakes and the corrections recommended by Extreme Networks support.

The Most Common Mistake

All configurations must be committed to the Running configuration before they are active. Be sure to click the Commit button in the upper right corner of the configuration screen. If anything doesn't appear to be working, click Commit before doing any further diagnostics. Click Save before rebooting or turning the AP off.

No Default Gateway Assigned to the Management Interface

Within the Controller profile, select Network -> Static Routes. Click Add Rows and enter 0.0.0.0/0 as the network address and your router IP address as the Gateway. This will set the default gateway for the system.

WLAN is not Broadcasting on My Test Laptop

This usually means then WLANs are not mapped to a radio. Within the Controller and Dependent AP profiles, select Interface -> Radios. Select radio1 and click Edit. Select WLAN Mapping and ensure WLANs are mapped to the radio on the left side of the box. Click OK, then exit. It may also mean the wrong country was selected.

Wrong Country Selected

US FCC certification requires that an access point used in the United States can only have a US country option. If the AP presents other country options in a list, the WLAN will be disabled if the AP is a US SKU. Be sure to check the label on the rear of the unit to see if you have a WR (worldwide RoHS) or a US (United States) SKU. The WR and US are appended to the end of the part number. Use the information in the Diagnostics section to view the State of the radio.

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Glossary of Features

This glossary provides a short description of key features found in the Altitude 4511 webUI.

Dashboard

The Dashboard provides graphical and statistics view of the network. A key feature in the dashboard allows the administrator to select from a list of critical parameters to display the network and client connectivity.

Summary

webUI navigation: Dashboard -> Summary

details: The overall health of the network is shown in summary. Top (or worst) five access points are sorted by number of clients, RF quality, and threat index. The number of clients connected on 5.2Ghz radios and 2.4Ghz radios is displayed in this summary view.

Network View

webUI navigation: Dashboard -> Network View

details: The network topology is displayed in a graphical view. Four key client parameters can be overlaid on the network view for a quick reference; RF Quality, Utilization, SNR, Threat. To view detailed statistics of the network, access points, and wireless clients; click on the Statistics link from the Network view. If you select an adopted AP, the Statistics link will show details for that particular AP. If you select the Controller AP, statistics will be displayed for the network.

Configuration -> Devices

Devices Configuration

WebUI navigation: Configuration -> Devices -> Device Configuration

details: Select a single device from the list of known devices. All configurations found in a policy can be overridden using this screen. It is recommended to use the policies and profiles to configure devices and use the Device override configurations sparingly. It is common to use policies for a group of devices, but use a configuration override to set a unique IP address. Additionally, if using the Altitude 4511 as a single, standalone access point, device configuration is the fastest way to configure the device.

Adoption Policy

webUI navigation: Configuration -> Devices -> Adoption Policy

details: Device adoption can be done manually, or by creating rules. When a dependent AP is adopted by a Controller, adoption rules determine 1) whether the dependent AP is adopted by this controller and 2) what profile to assign to the AP. Adoption rules include common parameters such as MAC address, serial number and DHCP option.

To manually assign an adoption policy to a device, go to the “Configuration -> Devices -> Device Configuration -> [select device in list] -> Cluster” menu. Select the policy from the drop down list.

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To manually assign a profile to a device (bypassing all rules or manual adoption), go to the "Configuration -> Devices -> Device Configuration -> [select device in list] -> Basic Configuration" menu. Select the policy from the drop down list.

Configuration -> Wireless

Create policies for WLANs and related parameters required for the wireless LAN.

Wireless LANs

webUI navigation: Configuration -> Wireless -> Wireless LANs

details: Create a WLAN policy and select access rules, QoS, firewall and VLAN policies to apply to the WLAN. Note that some policies are embedded within policies. For example, a QoS policy is required within the WLAN policy. This can lead to confusion during configuration. Anywhere a policy is required in a drop down list, there will always be a Create and Edit button. If the policy needs to be created, click the Create link next to the drop down box.

WLAN QOS Policy

webUI navigation: Configuration -> Wireless -> WLAN QOS Policy

details: Set the WMM QOS configurations to apply to clients connecting to the WLAN. WMM QoS is applied to client packets based on DSCP bit.

Radio QoS Policy

webUI navigation: Configuration -> Wireless –Radio QOS

details: Radio QoS applies to all packets on the radio regardless of WLAN. WLAN QoS rules will take priority.

AAA Policy

webUI navigation: Configuration -> Wireless -> AAA Policy

details: Create multiple AAA policies with unique RADIUS servers and secret phrase. AAA policies are required for Enterprise (802.1x) client authentication.

Association ACL

webUI navigation: Configuration -> Wireless -> Association ACL

details: Create policies to control access to the wireless LANs by filtering on the MAC address of the client.

Smart RF Policy

webUI navigation: Configuration -> Wireless -> Smart RF Policy

details: Create one SmartRF policy for the RF domain. An RF Domain is the collection of RF spectrum management tools employed by the Altitude 4511 for efficient use of the RF spectrum. The RF Domain is a key element of a Extreme Networks management entity. Note that all APs "belong" to an RF Domain. On the Altitude 4511 Controller AP feature, there is only one RF Domain supported. To configure multiple RF Domains for a large enterprise network, use an Extreme Networks RF Controller such as the Summit® WM3400, WM3600, or WM3700. These dedicated RF Controllers feature multiple RF Domain management, along with a host of sophisticated Layer 2 and Layer 3 features.

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SmartRF is a set of software algorithms that provides automatic transmit power adjustment, automatic channel selection, and automatic neighbor recovery if a failure occurs in a neighbor access point. On a dedicated RF Controller, SmartRF adds additional functionality for an enterprise network.

Bridging Policy

webUI navigation: Configuration -> Wireless -> Bridging Policy

details: Set whether a common VLAN will be bridged between wired and wireless interfaces.

Configuration -> Profiles

Profiles are containers to hold policies and configurations. Assign profiles to devices. The administrator can create multiple profiles for different applications of the wireless access points.

Most configurations will require the administrator to select a policy from a drop down list. For example, select an adoption policy from a drop down list. Other configurations will be done directly in the profile and will not be found in a policy. Examples of configurations that are not found in a policy include Fast Ethernet port configuration. These configurations will be set within the profile itself.

Configuration -> RF Domains

The RF Domain contains the SmartRF policy to manage the RF spectrum, and the WIPs policy for wireless security and intrusion protection.

Configuration -> Security

Security settings include complex firewall rules, WIPs policy, and Wireless Client Roles

Firewall Policy

webUI navigation: Configuration -> Security -> Firewall Policy

details: Create global denial of service rules and configuration and Storm Control with ARP, Ucast, Bcast, Mcast. Advanced settings provide more detailed configuration of TCP protocol and flows.

IP Firewall Rules

webUI navigation: Configuration -> Security -> IP Firewall Rules

details: Create multiple rules with filters based on source/destination IP address, and a set of IP protocols. Mark packets with an 802.1p bit or DSCP bit.

MAC Firewall Rules

webUI navigation: Configuration -> Security -> MAC Firewall Rules

details: Create multiple rules with filters based on source/destination MAC address, VLAN ID, 802.1P bit. Mark packets with a 802.1p bit or DSCP bit.

WIPS Policy

webUI navigation: Configuration -> Security -> WIPS Policy

details: Create a wireless security policy that tracks excessive network activity, client (MU) anomalies, and AP anomalies. Configure Rogue AP detection.

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Wireless Client Roles

webUI navigation: Configuration -> Security -> Wireless Client Roles

details: Create filters to identify clients and apply a unique set of IP or MAC layer firewall rules. Filter options include MAC address, connected AP, SSID, Authentication and Encryption types.

Configuration -> Services

Captive Portals

webUI navigation: Configuration -> Services -> Captive Portal

details : A captive portal will redirect a client web browser to an internal web site, or an external hosted site. Client authentication can be open, or by a RADIUS policy. A walled garden can be created by entering a DNS Whitelist of allowed domains. Four internal Web pages are supported; Login, Terms and Conditions, Welcome, and Fail. For a basic captive portal, enter text into the boxes supplied. For a more custom captive portal, use an externally hosted Website or link to an externally hosted set of Web pages.

DNS Whitelist

webUI navigation: Configuration -> Services -> DNS Whitelist

details : Enter domains that will be allowed in the captive portal prior to authentication. A client that has not authenticated via the captive portal can access websites in the DNS whitelist.

Configuration -> Management

Create management policies for customizing the management access rights and password authentication. Note that an External RADIUS server authentication is supported. Generally, one management policy is all that is required.

Diagnostics

Create filter rules to display network events. Filters can be set by severity and source MAC address. MAC addresses can be a radio BSS or a client MAC address.

Core and panic snapshots and UI logs may be requested by Extreme Networks customer support for remote diagnostics

Operations

Use the Operations menu to reset the AP to factory defaults, or reboot the AP to make changes effective. This screen will generate the startup and running configuration files for debugging and configuration diagnostics.

Device Details

webUI navigation: Operations -> Device Details

details: Displays the Primary and Secondary firmware and allows the administrator to select which firmware to use.

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File Transfers

webUI navigation:	Operations -> File Transfers
details:	Use this menu to upload firmware and configuration files to and from the access point. Click on the Advanced tab to select TFTP, FTP, SFTP, or HTTP and select the logical port number to use.

File Browser

webUI navigation:	Operations -> File Browser
details:	Use this menu to browse the file system and view files that have been saved to the access point

Statistics

Statistics are collected and displayed for the RF Domain, the Controller AP, and individual Dependent APs.

Depending on what is selected, a different set of statistics are displayed. One of the most useful statistics is the RF Domain -> SmartRF History. This view will show the actions of the SmartRF feature in the network.

To view a list of wireless clients, click on the Controller AP and select Wireless Clients.

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Appendix

LED Behavior

The Altitude 4511 has two LEDs to display device status. The green LED is used to indicate 2.4Ghz operation and the Amber LED is used to indicate 5Ghz operation.

You will note that the opposite LED will be used to indicate other states. For example, if operating in 2.4Ghz bands, the Green LED will indicate activity while the Amber LED will indicate state.

The following acronyms are used in the table:

CAP = controller AP

DAP = dependent AP

Standalone = individual AP managed by itself

State	Description
1	AP is booting up
2	DAP that is not adopted; or does not have a profile
3	DAP that is adopted and functioning
4	DAP that WAS adopted, but the Controller has died. AP retains previous config
5	CAP (controller AP) or Standalone AP that is functioning
6	CAP or Standalone that is not configured

State	Green LED	Amber LED
1	Solid	Solid
2	Solid	Solid
3	Blink with activity if 2.4Ghz; else off	Blink with activity if 5Ghz; else off
4	Blink with activity if 2.4Ghz; else on Solid	Blink with activity if 5Ghz; else on Solid
5	Blink with activity if 2.4Ghz; else on Solid	Blink with activity if 2.4Ghz; else on Solid
6	Solid	Solid

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Convert a MAC Address Into its Zero-Conf IP Address Equivalent

For example: MAC address 00:C0:23:00:F0:0A
Zero-conf IP address equivalent:
169.254.240.10

The last two bytes of the MAC address will become the last two octets of the zero-conf IP address.

Use Windows Calculator to convert Hex to Decimal

Select View -> Scientific

Click “Hex”

Enter the hex byte, e.g. F0

Calculator
Edit View Help
F0
Hex Dec Oct Bin
Qword Dword Word Byte
Inv Hyp
Backspace CE C
Sta F-E ( ) MC 7 8 9 / Mod And
Ave dms Exp ln MR 4 5 6 * Or Xor
Sum sin x^y log MS 1 2 3 - Lsh Not
s cos x^3 n! M+ 0 +/- . + = Int
Dat tan x^2 1/x pi A B C D E F

Click “Dec”

Calculator
Edit View Help
240.
Hex Dec Oct Bin
Degrees Radians Grads
Inv Hyp
Backspace CE C
Sta F-E ( ) MC 7 8 9 / Mod And
Ave dms Exp ln MR 4 5 6 * Or Xor
Sum sin x^y log MS 1 2 3 - Lsh Not
s cos x^3 n! M+ 0 +/- . + = Int
Dat tan x^2 1/x pi A B C D E F

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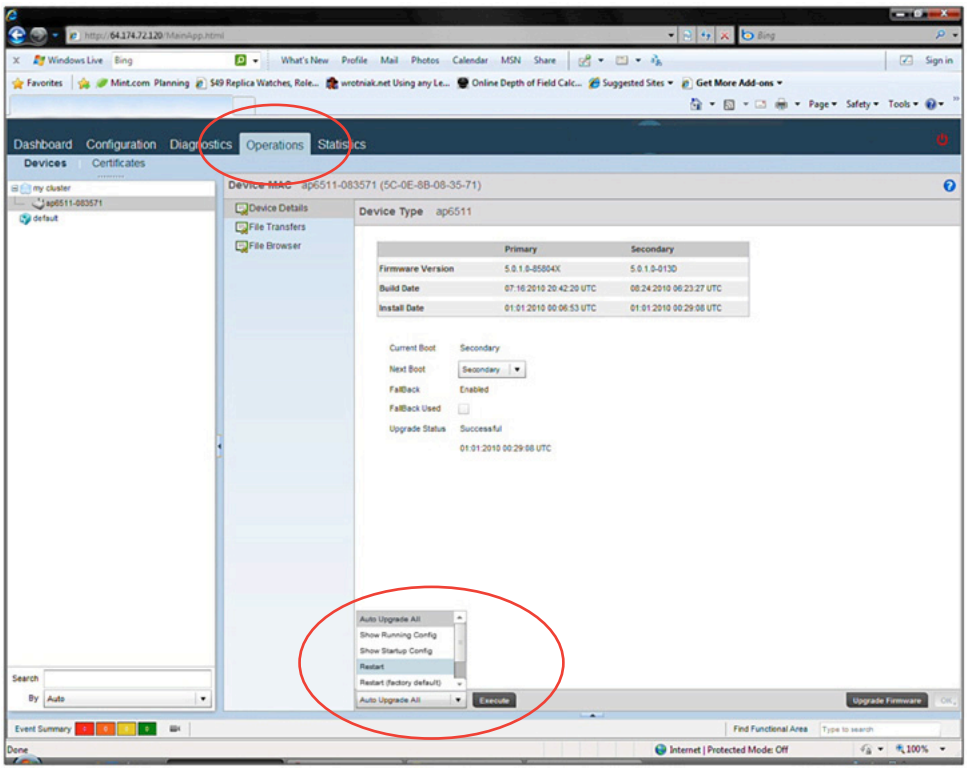
Reset to Factory Defaults

There are two ways to reset the unit to factory defaults.

To revert to factory default configuration using the hardware reset button on the bottom of the unit:

1. Remove power from the AP
2. Using a paper clip, press and hold the reset button on the back of the unit. The reset button is located on the serial label, below the words “part number”
3. Apply power by connecting a PoE source
4. The amber LED will blink slow three times
5. When ithe Amber LED blinks fast, release the button
6. The AP will continue to boot in its default configuration state

From the webUI, navigate to the Operations main menu. Select Reset (factory default) from the menu at the bottom of the page. Click Execute.



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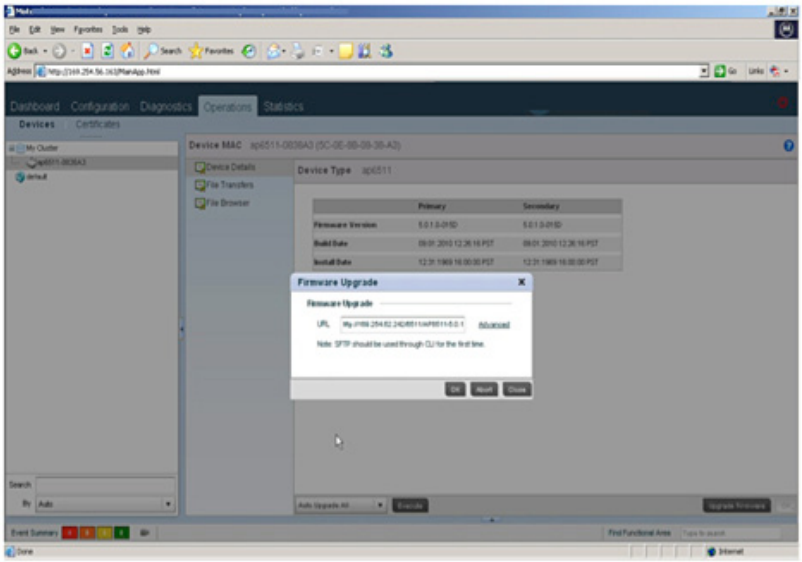
Upgrade the Firmware

Click on Operations -> Devices. Select the AP on the left side.

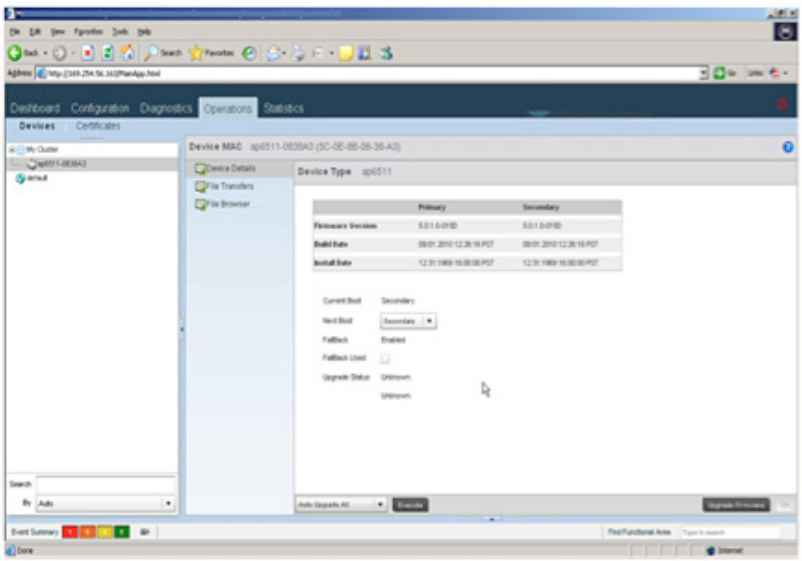
Click the Upgrade Firmware button in the lower right corner.

Enter the TFTP or FTP URL and path. For an easier data entry, click the Advanced option to enter the IP address, user name, password, and path in separate entry boxes.



When the upgrade is complete, note the firmware versions and the Next Boot image.

Select Restart from the menu in the lower left corner. Click Execute.



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